

## **AMENDMENTS TO THE SPECIFICATION:**

Please amend page 1, paragraph 3, to read as follows:

### **FIELD OF THE INVENTION**

The present invention relates generally to chemical treatment of articles and, more particularly, to ~~application of~~ a composition for suppression or elimination of noxious odors and its application to textiles, footwear articles, sanitary products and/or the like ~~so as to suppress or eliminate noxious odors.~~

Please amend page 1, paragraph 4, to read as follows:

### **BACKGROUND OF THE INVENTION**

It is well-known that human feet often emanate noxious odors when footwear is, for example, shoes, are removed, especially after being worn for an entire day. This phenomena, it has been found, is even more noticeable with ~~footwear such as~~ shoes made of a material, ~~for instance,~~ such as a synthetic or rubber, that prevents transpiration of foot perspiration during use. After prolonged use, the shoes frequently becomes impregnated with ~~such~~ offensive odors and it they too become[[s]] a source of ~~offensive~~ such odors.

Please amend page 1, paragraph 5, to read as follows:

~~At present~~ Presently, there ~~does not exist any~~ is no truly effective remedy for ~~this~~ bothersome the annoyance and inconvenience of foot odors. Indeed, ~~of the few~~ products available on the market ~~today manage to procure only a~~, none achieve more than slight attenuation of ~~the bad smell, so that one cannot really appreciate any~~ noxious foot odors. In other words, use of conventional products have yielded no significant improvement deriving from the use of these products in odor reduction. The ~~bad-smell~~ age-old problem of ~~the feet has~~ noxious foot odor, therefore, ~~remained~~ remains, without ~~[[a]]~~ solution ~~to this day~~.

Please amend from after paragraph 5 on page 1 to before the first full paragraph on page 6 to read as follows:

~~Various studies carried out in this connection have~~ Research has shown that the ~~bad-smell~~ noxious odors emitted by ~~the~~ human feet ~~is due to~~ are caused by a particular type of fungus, commonly known as Tinea ~~pedis~~ Pedis, that proliferates in anaerobic environments, ~~finding in particularly an optimal habitat, at body temperature~~, in the interstices between the third, fourth and fifth toe. ~~In fact, That~~ this is the least exposed and aired area of the ~~feet, where it~~ foot, combined with the normal body temperature conditions (equal to about 37°C) characteristic of a person's foot, provides a habitat that is

optimal for fungal growth. In turn, the fungus readily takes root and resists the humidity deriving both from both the sweating and the upon washing of the same user's feet.

Please amend page 2, first full paragraph, to read as follows:

The As sweating of the foot increases or intensifies, so does the \_\_\_\_\_ degree of humidity[[,]] and , in turn, consequently also the proliferation of Tinea Pedis and the noxious odors that result the fungus and the bad smell to which it gives rise, obviously augments as the sweating increases. The intensity of the sweating is bound up that occurs during footwear use depends not only with on the individual predisposition of the person, but obviously also on the type of shoe that is being worn. It is well-known conventional wisdom, for example, that sport shoes tend have a tendency to hinder transpiration, and the. The particularly abundant sweating and, hence, moisture that derives there from results, together with the anaerobic environment and the body temperature conditions of the foot (equal to about 37°C, i.e. the body temperature), render the situation it has been found, are particularly favorable for the proliferation of Tinea pedis Pedis.

Please amend page 2, second full paragraph, to read as follows:

### **OBJECTS AND SUMMARY OF THE INVENTION**

Accordingly, it is an object of the present invention to provide a ~~fully effective~~ composition and a method that are effective in for neutralizing entirely the proliferation of

odiferous fungi and, therefore, completely eliminating noxious odors often characteristic of sweating feet.

Please insert the following new paragraphs after the second full paragraph on page 2:

- - It is another object of the present invention to provide a composition suitable for ready application to and/or impregnation of socks, stockings, or another textile or footwear article coming into contact - directly or indirectly - with a portion of the user's foot to be deodorized, so as to achieve stable, persistent and lasting odor suppression, even after successive washings of the article.

According to one aspect of the present invention, there is provided a method of treating, or partially or wholly impregnating, a textile and/or footwear article to be worn on, or associated with, a user's foot with an active deodorizing ingredient which comprises elemental sulphur, or a composition capable of liberating elemental sulphur. Initially, the article is treated or impregnated with a selected composition having, in addition to the active ingredient, a polymeric binder for providing stable adherence of the active ingredient to the article and gradual release therefrom over time. The polymeric binder is preferably a selected acrylic, silicone, butadiene or polyurethane resin. The active ingredient and resin are distributed in an aqueous bath in which the article is immersed. The active ingredient has a concentration in the aqueous bath between about 0.3 g/l and about 1.0 g/l, and the resin is a selected silicon resin having a concentration between about

10 g/l and about 20 g/l. The aqueous bath further comprises a selected cationic surfactant and a selected softener at concentrations between about 10 g/l and about 20 g/l, and about 2 g/l and about 5 g/l, respectively.

In accordance with another aspect of the present invention, a composition is provided for partially or integrally treating a textile and/or footwear article to be worn on, or associated with, a user's foot. The composition has an active deodorizing ingredient which comprises elemental sulphur or a mixture capable of liberating elemental sulphur. The article includes, in addition to the active ingredient, a selected polymeric binder for providing stable adherence of the active ingredient to the article and gradual release therefrom over time. The polymeric binder is preferably a selected acrylic, silicone, butadiene or polyurethane resin. The active ingredient and the resin are distributed in an aqueous bath in which the article is immersed. The active ingredient has a concentration between about 0.3 g/l and about 1.0 g/l. The resin is a selected silicon resin and has a concentration between about 10 g/l and about 20 g/l. The aqueous bath further comprises a selected cationic surfactant and a selected softener having concentrations of between about 10 g/l and about 20 g/l, and about 2 g/l and about 5 g/l, respectively.

According to a further aspect of the present invention, there is provided a composition for partially or integrally treating a textile and/or article to be worn on, or associated with, a user's foot. The composition has an active deodorizing ingredient that includes elemental sulphur or a mixture capable of liberating elemental sulphur. The composition comprises, in addition to the active ingredient, a selected polymeric binder for providing stable adherence of the active ingredient to the article and gradual release

therefrom over time. The polymeric binder is desirably a selected acrylic, silicone, butadiene or polyurethane resin. The active ingredient and the resin are distributed in an aqueous bath in which the article is immersed. The active ingredient has a concentration between about 5 g/l and about 10 g/l and is emulsified with a selected non-ionic surfactant. The resin is a selected emulsified acrylic resin and has a concentration between about 3 g/l and about 5 g/l. The bath, in the case of a wool-based article, has a pH at least slightly acidic using acetic acid or, in the case of an article with a cellulose base, a relatively neutral pH.

In accordance with yet another aspect of the present invention, a textile and/or footwear article is provided that is integrally or partially impregnated or treated with a composition having an active deodorizing ingredient which comprises elemental sulphur or a mixture capable of liberating elemental sulphur, the article being treated or impregnated with such composition. The composition comprises, in addition to the active ingredient, a selected polymeric binder for providing stable adherence of the active ingredient to the article and gradual release therefrom over time. It is preferred that the polymeric binder be a selected acrylic, silicone, butadiene or polyurethane resin, and that the active ingredient and resin be distributed in an aqueous bath in which the article is immersed. The active ingredient has a concentration in the aqueous bath between about 0.3 g/l and about 1.0 g/l. The resin is a selected silicon resin and has a concentration between about 10 g/l and about 20 g/l. The aqueous bath further comprises a selected cationic surfactant and a selected softener at concentrations between about 10 g/l and about 20 g/l, and about 2 g/l and about 5 g/l, respectively. - -

Please amend from after the second full paragraph on page 2 to before the first full paragraph on page 3 to read as follows:

~~According to the invention, the substance capable of inhibiting the bad smell of the feet is constituted by elementary sulphur, preferably in the micronized state. In this form it is preferably applied to socks, stockings or any other textile or footwear product intended to come into - direct or indirect - contact with the part that is to be deodorized. To this end the active principle is combined with the other substances with a view to realizing a stable fixing to the support, assuring a persistent release of the active principle in the course of time, and this even after a succession of washings.~~

Please amend page 3, first full paragraph, to read as follows:

~~Socks treated in the manner just described render the feet free of bad smell, even after a toilsome day during which use has been made of sport shoes. Experimental tests carried out on persons particularly prone to this kind of problem, who for this purpose were made to wear treated socks, demonstrated the complete disappearance of the bad smell. Moreover, repeated washings of the socks did not bring out any perceptible decay of the deodorizing properties. No allergic manifestation of any kind to the detriment of the wearers were revealed by any of the tests.~~

Please amend from after the second full paragraph on page 3 to before the first full paragraph on page 4 to read as follows:

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring now to further particulars of the present invention, there is provided a specific, illustrative deodorizing composition and method ~~to be used~~ for treating an article to come into direct or indirect contact with a user's foot, such articles including, but not limited to socks, stockings, insoles, soles and uppers of shoes, so as to provide yield footwear articles that do not acquire an unpleasant odor during use. According to various aspects of the present invention, such treatment is preferably carried out by the manufacturer of the article before it is brought to market and ~~even~~, in the case of soles, uppers or other parts of shoes, before or during production of the shoe.

Please amend page 4, first full paragraph, to read as follows:

~~A simple~~ The following is an example of a preferred deodorizing composition , according to one aspect of the present invention, for applying the a preferred active principle or ingredient to a pair of socks consists of. More specifically, the composition includes an aqueous solution containing the following:

- about 0.2 g/l ~~[[÷]]~~ to about 0.3 g/l of wettable ~~elementary~~ elemental sulphur (i.e., the active principle), preferably in micronized form;



- about 10 g/l ~~[[÷]]~~ to about 20 g/l of resin, for example, a silicon resin ~~for example;~~
- about 10 g/l ~~[[÷]]~~ to about 20 g/l of a cationic surfactant, e.g., a common ~~fixative for dyes~~ ~~for example;~~
- about 2 g/l ~~[[÷]]~~ to about 5 g/l of softener, such as a perfumed Henkel™ ~~softener~~ ~~for example.~~

Please amend page 4, second full paragraph, to read as follows:

The ~~Desirably, the~~ socks to be treated are immersed for a few minutes in the a bath prepared ~~in this manner, which is as set forth above. With socks made of a fibrous material containing wool, for instance, it is preferred that the bath be~~ brought to a temperature of about 40°C ~~when a fibrous material containing wool is involved, or. In the case of other materials, the temperature of the bath is increased~~ to about 90°C ~~in the case of other materials. The~~ Those skilled in the art will appreciate, however, that not only the treatment time and temperature, but also the formulation of the composition, may ~~however~~ be varied selectively according to the particular machine employed. ~~The indications provided~~ Generally speaking, the parameters described above are considered to be optimal in the case of treatment ~~with using~~, for example, a centrifugal washing machine. ~~The treatment~~ Treatment is then completed with a brief phase of rinsing, drying and centrifuging, this once again at a temperature that may be varied according to the type of textile fiber employed. Moreover, ~~the immersion in such an~~ aqueous bath may be replaced

by a treatment phase in which the composition is sprayed directly onto the articles ~~by means of using a conventional~~ ejection devices ~~of a known type~~.

Please amend from after the second full paragraph on page 4 to before the first full paragraph on page 5 to read as follows:

Alternatively or concurrently, the active ~~principle may also be~~ ingredient is applied prior to the actual ~~manufacturing~~ manufacture of the articles of clothing such as footwear articles, i.e., to the fabrics from which these articles are to be made. This ~~can be done~~ may be accomplished, for example, in a through continuous ~~operating~~ modality by carrying out the impreg-nation in operation using a foulard machine with a bath ~~containing~~ comprising about 5 g/l [[÷]] to about 10 g/l of the active principle ingredient in emulsified form ~~with having a selected~~ non-ionic surfactant, about 3 g/l [[÷]] to about 5 g/l of emulsified acrylic resin, in a pH made slightly acidic ~~by means of using~~ acetic acid (pH=5) in the case of wool-based fabrics, or in with a neutral pH ~~in case of for~~ fabrics ~~with having~~ a cellulose base. Following a step of wringing the fabric, the fabric is preferably dried in a “Rameuse” machine at a temperature of at least about 150°C, which is considered necessary to assure ~~the~~ polymerization of the acrylic resin.

Please amend page 5, first full paragraph, to read as follows:

~~In the compositions suggested above~~ general, the resin ~~obviously has the fundamental function of~~ portion of the composition described above fundamentally operates to fixing or adhere the active principle ingredient to ~~the~~ a textile fiber, the fiber holding and/or being impregnated with the principle ingredient and, thus, making it resistant to subsequent washings. ~~Being in the~~ In a micronized state, the elemental sulphur is released from the composition very slowly, ~~thus thereby~~ thus assuring its deodorizing action ~~in over~~ over the course of time. Neither the silicon resin nor the acrylic resin cause[[s]] any appreciable alteration ~~of the~~ in softness characteristics of the fiber ~~and they are therefore~~ , making them particularly suitable for ~~this the purpose intended~~. ~~Other~~ Optionally, other types of resins may ~~however be used=~~ be utilized, for instance, resins with a butadiene base ~~being a case in point=~~, even if combined in appropriate proportions.

Please amend page 5, second full paragraph, to read as follows:

~~In case of~~ When applying the composition to materials ~~with having~~ having a woolen base, it is preferable to use resins , such as those with radical-type polymerization mechanisms, that are capable of being polymerized at low temperatures ~~, like those with radical-type polymerization mechanisms~~. In any case, the softener may serve to attenuate a possible stiffening effect ~~deriving from~~ due to the presence of ~~the~~ a resin. The surfactant ~~obviously~~

~~contributes to, in turn, aids in~~ increasing the fixing power of the elemental sulphur to the fibrous material.

Please amend page 6, paragraph 1, to read as follows:

~~Application~~ The present invention has been found particularly advantageous for application to textile fibers, for example , ~~and~~ typically in accordance with the modalities described above, ~~represents a particularly advantageous reduction to practice of the invention,~~ because it ~~assures an~~ insures optimal effectiveness of the deodorizing action without ~~in any way~~ altering either the appearance or the original softness of the supporting materials, which ~~will~~ also remain ~~wholly~~ completely free of ~~smell~~ odor. ~~However~~ Alternatively or concurrently, this application ~~can be carried out with various modalities,~~ may be accomplished by various modes of operation, ~~especially in accordance with the variations of~~ by variation in the material for which it is intended and , therefore, also ~~of the~~ machines that are employed. For ~~example~~ instance, ~~the latter could include the~~ so-called “Dutch machines” could be utilized, whereby ~~the~~ movement of the bath is more gentle and thus avoids ~~the~~ physical alteration of materials made of wool fibers.

Please amend page 6, paragraph 2, to read as follows:

As ~~already mentioned~~ indicated previously, another ~~possible advantageous~~ beneficial use of the present invention ~~envisages the~~ contemplates application of a

sulphur-based composition directly to shoes, ~~in particular by treating in accordance with~~  
~~namely, through treatment according to~~ one of the above-described modalities, ~~of~~ the  
 textile lining of an insole intended to come into contact with the user's foot. ~~Either~~  
~~alternatively or in addition thereto~~ Further in the alternative or concurrently therewith, the  
 elementary sulphur ~~could be~~ is mixed with the a selected glue often employed for fixing  
 the securing a textile lining of the shoe to the base material (generally a polyurethane) of  
 the shoe insole.

Please amend from after paragraph 2 on page 6 to before the first full paragraph on  
 page 7 to read as follows:

In the ~~generically sanitary field~~ art of cleaning and disinfection, a deodorizing  
 cream for local use can readily be obtained by amalgamating the ~~elementary~~ elemental  
 sulphur, or a substance ~~with an elementary~~ having an elemental sulphur base, with  
 vaseline or lanoline in proportions appropriate for obtaining the required density and  
 homogeneity. According to a typical composition, for example, about 3% by weight ~~of~~  
~~elementary elemental~~ sulphur ~~will be~~, the sulphur is mixed with vaseline and lanoline in  
 equal percentages. Deodorizing properties ~~can also be conferred upon~~ may also be applied  
to swathing strips and elastic bandages, ~~in accordance with one of the above-described~~  
 methods described above for fixing the active principle ingredient to textile materials.

Please insert the following new paragraph after the paragraph from after paragraph 2 on page 6 to before the first full paragraph on page 7

- - Overall, socks, or other articles associated with a user's foot, treated in accordance with the present invention, render a user's foot entirely free of noxious odors, even after a day of extensive activity wearing sport shoes. Experiments conducted on feet wearing treated socks, with user's particularly prone to foot odors, resulted in complete eradication of noxious foot odors. Repeated washings of the socks did not result in any noticeable loss or decay in deodorizing properties. Moreover, no allergic reaction of any kind were experienced by any of the users. - -

Please amend page 7, first full paragraph, to read as follows:

~~In any case,~~ It shall be understood by those skilled in the art that the specific application procedures and applications underlying the preferred embodiments, as set forth herein, are not ~~must not be understood as characteristics that intended to limit the present invention. In its most general expression, indeed~~ Generally speaking, the invention ~~resides in having identified~~ includes the identification of an active principle ingredient that is not only capable of inhibiting the proliferation of the fungus, e.g., Tinea Pedis, that ~~generates the bad smell of the feet causes noxious foot odor, eliminating it but also eliminates such odors~~ completely, even when the ~~feet remain enclosed~~ foot remains encased in a shoe[[s]] for ~~the whole of a~~ an entire day, without any ~~undesired~~ adverse

effects ~~for to~~ the wearer as ~~far as intolerance or to~~ allergic reaction[[s]] ~~or other intolerance~~ are concerned. It ~~should also be noted~~ is also considered noteworthy that the active ~~principle in question~~ ingredient of interest, namely, elemental sulphur, apart from being inert, does not interact with ~~the~~ sebaceous secretions and is, therefore, absolutely tolerable from both a hygienic and sanitary standpoint of view.

Please amend page 7, second full paragraph, to read as follows:

~~The protective scope of~~ Although the present invention ~~thus comprises~~ has been described in connection with any use of ~~elementary~~ elemental sulphur for ~~the deodorization of the~~ deodorizing a user's feet, while variants those skilled in the art will appreciate that ~~and/or modifications can be brought to the procedures of its application~~ can be made to other such textile products such as yarns, cloths of various compositions, stockings, socks ~~and the like~~, footwear ~~products~~ articles, and the like, ~~as also in the~~ sanitary sector, ~~without thereby departing from the said scope~~ giving consideration to the purpose for which the invention is intended.